



**endoscopy  
support  
services, inc.**

# **operation manual service manual**

## **Xenon XL-A100**

high-intensity light source  
with automatic intensity-control



## **Xenon XL-M100**

high-intensity light source  
with manual intensity-control



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## 1 safety reference / place the equipment

### 1.1 safety reference

#### normal use

The equipment may only be used with accessories, wearing parts and disposable items, which have been designated by E.S.S., Inc as suitable for the instrument or the safety use of which is proven.



#### user qualification

The equipment may only be used by persons, who have a corresponding specialised qualification and who have been instructed in use of the equipment.

It is the user's responsibility to make sure, the equipment is safe and operates properly before using the equipment.



### 1.2 place the equipment

#### unpacking / items included

Carefully unpack the equipment and accessories and remove it from their packing.

Check for missing items and evidence of shipping damage.

File any complaints with the manufacture or supplier immediately.

Retain the original packing materials for later use. These can come in handy, when the equipment must be transported.

Please verify immediately after having unpacked the equipment, whether the delivery is complete.

The standard extent of delivery includes of the following:

- control unit
- power supply cord
- manual

Comment:

#### safety precautions at the site of installation

Always place the equipment on a solid base.

Make sure, that air circulation is sufficient.

Never cover the louver type slots of the unit.

The equipment may be used only in rooms having electrical installations conforming to applicable national, state and local electronical codes.

The unit must be joined to the central potential equalisation of the operating theatre or of the equipment trolley by means of a grounding cable.

The device must be connect to line voltage using the delivered protectively earthed power supply cord.

The equipment may not be used in areas, where there are dangerous flammable gases.

The equipment may only be connect to devices, which also comply to the IEC601-1.

Never look direct in the lightbeam of a light source.



## 2 general advises / signs and symbols

Thank you for your expression of confidence in the E.S.S., Inc brand name.

Like all of our other products, this product is the result of years of experience and great care in engineering and manufacture.

This manual is destined to learn you understanding the function and the operation of your equipment.

Before you switch on the equipment for the first time, please thoroughly read this manual and pay special attention to all safety instructions, so that endangering for the user and the patient is precluded.

Please always store this manual with the equipment.

### data of the equipment

The type label (rear of unit) contains technical data, type and serial number of your unit. Please always indicate these data when ordering spare parts or in case of any question.

Please enter here the technical data of your device! ➔

Serial No.:	_____
Type:	_____
Date:	_____
Class:	_____
Hz:	_____
Amp.:	_____
Volt:	_____

### warranty

1 year according to our warranty conditions.

Opening the equipment or performance of any repairs or modifications of the equipment by unauthorised persons shall relive E.S.S., Inc of any liability for its performance. Any such opening, repair or modification performed during the warranty period shall void all warranty.

Wear parts are not included in the warranty.

The firm of E.S.S., Inc shall be liable for failure or deterioration in the safe operation, operational reliability and performance of this equipment only subject to the conditions, that all assembly operations, system expansions, readjustments or repairs to same have been performed by a person or persons duly authorised by E.S.S., Inc, that all electrical installations at the location of us meet applicable national and local electrical codes and that the instrument has been used in accordance with its operating instructions at all times.



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Errors and technical changes excepted.

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### symbols



attention, important note!



safety note!



service

### signs



please read the enclosed instructions



unit model BF



beware of dangerous electrical voltage



connection for ground potential



alternating voltage

### **3 description of the equipment**

The light source you have purchased offers high intensity 100W Xenon illumination for use with almost every endoscopic discipline. The colour temperature equals daylight quality with a colour temperature of 5.600 K and the life expectancy amounts to 500 hours.

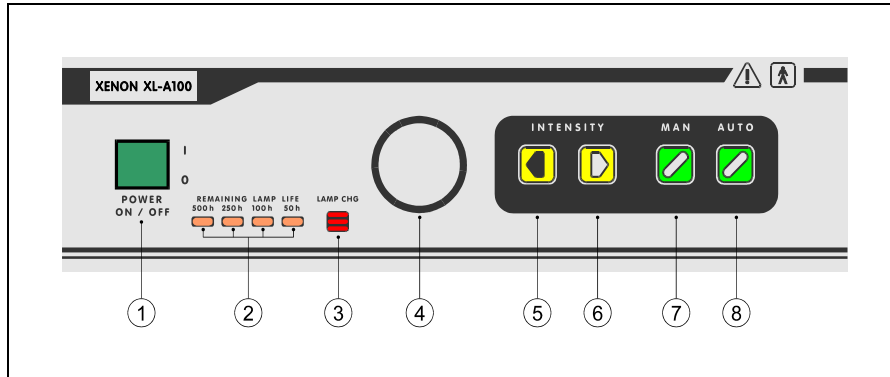
A mechanical diaphragm is used to control the output intensity of the Xenon lamp without influence on the colour temperature.

The lamp is especially designed for endoscopic applications.

The equipment complies with the latest safety standards for medical products and is approved to CE.

## 4 operating elements

### 4.1 operating elements on the frontpanel



- ① main switch
- ② LEDs remaining lamp life (only Xenon XL-A100)
- ③ LED lamp change (only Xenon XL-A100)
- ④ connector for lightguide
- ⑤ push button 'decrease intensity'
- ⑥ push button 'increase intensity'
- ⑦ push button 'manual mode' (only Xenon XL-A100)
- ⑧ push button 'automatic mode' (only Xenon XL-A100)

#### mains switch

The control unit is turned on by switching the mains switch.

The mains switch has two different switching positions:

- I switched on
- O switched off

When the control unit is switched on, this is indicated by the up-light green lamp inside the switch.

#### remaining lamp life indicator (only Xenon XL-A100)

Indicated the remaining life of the lamp (500h).

After the lamp has been ignited, the remaining lamp life indicator will also light up.

First of all it will execute a lamp-test, after that, one of the LED's (either 500, 250, 100 or 50h) will indicate the remaining life expectancy of the lamp.

If the recommended use of 500 hours has expired, this will be indicated by flashing of the red LED (LAMP CHG). Then the lamp should be replaced with a new.

#### connector for lightguide

This connector is used to connect and adjust the lightguide to the lightsource. There is an interchangeable adapter screwed in. The adapter used has to match the lightguide fitting you are using. Several adapters for all types of lightguides are available. Most of these adapters have an automatic snap-in for the lightguide.

#### pushbutton 'decrease intensity'

Use this button to decrease the output intensity of the lightsource. If the mechanical diaphragm is completely closed, this is indicated by the yellow light inside the button.

#### pushbutton 'increase intensity'

Use this button to increase the output intensity of the lightsource. If the mechanical diaphragm is completely open, this is indicated by the yellow light inside the button.

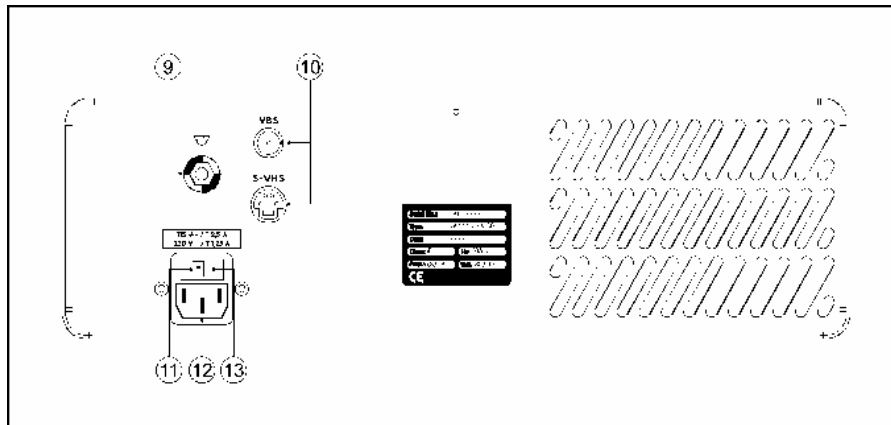
**pushbutton 'auto mode' (only Xenon XL-A100)**

Use this button to enable the light source in automatic mode. This will be indicated by the green light inside the button.

**pushbutton 'manual mode' (only Xenon XL-A100)**

Use this button to enable the light source in manual mode. This is indicated by the green light inside the button.

## 4.2 operating elements on the rear



- ⑨ pot. ground connector
- ⑩ video in connector (only Xenon XL-A100)
- ⑪ line voltage indicator
- ⑫ line connector
- ⑬ fuse holder

**pot. ground connector**

Basically, the control unit is protectively earthed by the 3-pin power supply cord when it is connect to a protectively earthed wall socket, as prescribed.

When running the equipment in rooms which comply to class 1 or 2E according to MedGV, the control unit must be joined to the central potential equalisation of the operating theatre or of the equipment trolley by means of a grounding cable.

**video in connector (only Xenon XL-A100)**

You can attach external video input to the video in connectors.

The video signal can be connect in two different standards.

- The BNC-terminal require the videosignal as VBAS-signal (composit-signal, VHS-standard).
- The 4-pin-Y/C-terminal require the videosignal as Hosiden-signal (separate conductors for chroma- and luminance-signal, S-VHS-standard).

**fuse holder / line voltage indicator**

Contains the mains fuses. The window inside the drawer shows the currently selected mains voltage. You have to control whether your mains voltage corresponds with the selection shown in the window.

**line connector**

The plug of the power supply cord is connect to the mains terminal device.



## 5 connecting and operating the equipment

Before you connect the mains plug, check on the back of the equipment that the voltage indicated (in the square panel above the mains socket) is the correct one.

voltage = 230VAC → indicator '230'

voltage = 115VAC → indicator '115'

If the incorrect voltage is indicated then the equipment may under no circumstances be connect.

Before connecting a light cable into a light source adapter of the equipment, please ensure that you have the correct plug and adapter. A plug that is too long or too thin can for example be pushed too far into the equipment, and can damage the sensitive diaphragm or lens inside. This will result moreover in considerable loss of light, in the same way as a plug that is too short, or a plug of the wrong diameter, because of the wrong position of the contacts at the light entry.

All wiring has to be done before switching on the equipment.

After switching on a light source and the ensuing ignition of the lamp, the equipment should remain switched on for at least ¼ hour. A shorter shining period will considerably shorten the life expectancy of the lamp! After switching off a light source however, it may be immediately switched on again. A waiting period or cooling off period is not necessary.

### **connect the power supply cord**

Use the delivered protectively earthed power supply cord to connect the control unit to the mains.

### **connect the external input devices (only Xenon XL-A100)**

As described before, there are several standards of video signal available on the rearpanel. Here you can connect external input. If you are using standard VBS-signal (BNC-terminal), please always apply high-quality 75Ω-coaxial cables. If the external output device has a switchable 75Ω-termination resistor, you should switch this on. If you connect several devices in a row, only the last device in the line needs to be terminated by the termination resistor.

If the external device does not provide such a termination resistor, you should connect the coaxial cable via a T-connection-adapter. The open end of the T-connection adapter is then terminated with the 75Ω-resistor.

### **connect the potential equalisation conductor**

Join the terminal device for potential equalisation on the rearpanel with the central potential equalisation of the operating theatre or of the equipment trolley.

## 5.1 operating the equipment

### 5.1.1 operating the equipment without video input

#### switching on the equipment

After connecting the mains, the grounding conductor, the light cable and the endoscope, the equipment is ready for use, and can be switched on at the mains switch. The green mains light (Power) inside the switch will light up. After 5-10 seconds the lamp will automatically ignite. It will burn with full power right from the start. At the same time the ventilator will start to run.

#### setting manual mode (only Xenon XL-A100)

Now you can set the mode: in this case manual regulation of light intensity. To set this mode, you press the push button 'MAN' which will turn on this mode of operation. This will be indicated when the green LED in the key lights up.

#### setting the light intensity

The output of light can now be adjusted either stronger or weaker by the push button 'INTENSITY'. If you press the push button 'decrease intensity', light intensity will decrease. Then intensity is adjusted by a mechanical diaphragm with the result that the spectrum of white light does not change when dimmed. When the diaphragm is completely open for maximum light intensity or completely closed for minimum light intensity (when the respective key is pressed), this will be indicated by the yellow LED light in the corresponding key.

### 5.1.2 operating the equipment with video input (only Xenon XL-A100)

#### switching on the equipment

Connections or wiring of the equipment: Besides the mains connection and the connection of the light cable with endoscope, the video signal must now also be connect to the equipment.

The corresponding sockets are located on the rear panel of the equipment.

You can see the two sockets leading in (S-VHS Y-C, BNC).

The BNC socket is for connecting the standard so called Composite Video Signal, for example CCIR-Norm, where there is colour and black/white information on a coaxial (two-lead cable). This is the usual system with older colour and also black/white cameras, both of which can be connect here.

The Y/C socket is for connecting the newer colour cameras, which work with the so called Super-VHS System, or also Y-C signals. Here the picture brightness control (Y-signal) and colour control (C-signal) are split, with the result that a 4-veined cable and a 4-pole plug is necessary.

Usually the signal coming from the video camera is fed into the VIDEO IN socket of the monitor and then fed either from the VIDEO OUT socket of the monitor (if available) or using a T-connection-adapter further on to the lightsource.

If shadow pictures appear on the monitor, because of a very long length of the cable, the video signal must be terminated with a 75  $\Omega$ -termination-resistor so as to suppress the disrupting reflections in the cable.

In this case, the video signal is fed into the lightsource using a further T-connection-adapter. The open end of the T-connection-adapter is fitted with the 75  $\Omega$ -resistor.

Basically only 75  $\Omega$  video cable should be used when connecting the equipment together, so that you obtain the best picture quality.

After connecting the mains, the grounding conductor, the light cable and the endoscope, the equipment is ready for use, and can be switched on at the mains switch. The green mains light (Power) inside the switch will light up. After 5-10 seconds the lamp will automatically ignite. It will burn with full power right from the start. At the same time the ventilator will start to run.

#### setting the camera

Standard video cameras usually have a so called AGC switch (Automatic Gain Control = automatic control of the light). This switch should be switched of, when using the light source with video control, as otherwise there can appear uncontrollable variations in the picture brightness when in use, because the AGC counteracts the control of the light source.

If the camera is a so called shutter-camera you should observe the following:

If the camera has only one possible shutter speed (e.g. 1/1000 sec.), then this should be set at off during normal use, as otherwise the picture on the monitor will be very dark, because of much shorter exposure time compared with normal use. If the shutter-camera, however, is fitted with a floating shutter control, that means that it will, by changing the shutter speed, automatically adjust

the brightness of the picture, with the result that the camera can operate without problem with the video control of the light source. The electronic camera control must however operate very fast, and then this co-operation of the equipment will give very good results (fast and exact adjustment of brightness over the whole screen).

If the automatic control on the camera works relatively slowly, then variations can happen (counteraction of the camera control against the control on the light source). In this case, the automatic control on the light source must be switched off by pressing the button 'MAN'. With the push buttons 'INTENSITY', the brightness of the light source must be adjusted (average brightness), so that the shutter can then adjust the brightness of the whole area with its control.

#### **setting automatic mode**

With standard cameras, therefore, for automatic brightness control through the light source, you set the automatic mode by pressing the push button 'AUTO', and the green LED in the button then lights up. When you switch on 'AUTO', the electronics will also automatically switch to an average brightness from then on.

#### **setting the brightness on the monitor screen in auto-mode**

If the automatically set picture brightness is not sufficient, or if it is too bright, then brightness can be adjusted brighter or darker by the push buttons 'INTENSITY', as with manual operation. When the brightness diaphragm on the light source is completely open or completely closed, this will be indicated by the yellow LED light in the brightness buttons.

#### **remaining lamp life indicator**

After the lamp has been ignited, the remaining lamp life indicator will also light up.

First of all it will execute a lamp-test, after that, one of the LED's (either 500, 250, 100 or 50h) will indicate the remaining life expectancy of the lamp.

If the recommended use of 500 hours has expired, this will be indicated by flashing of the red LED (LAMP CHG). Then the lamp should be replaced with a new.

## 6 service manual / maintenance of the equipment

### general maintenance and repair advice

The instructions and information given in this chapter are only for instructed personnel, who are aware of the safety precautions necessary for repair and maintenance of medical electronic devices.



E.S.S., Inc refuse any liability for unauthorised repair and modification.

The manufacturer will provide those circuit diagrams, itemised parts listings, descriptions, sets of adjustment instructions and other items of available documentation to suitably qualified user personnel duly authorised by the manufacturer for their use in repairing those components of the equipment that have been designated by their respective manufactures as reparable.

Only the supply of such technical documentation relating to the equipment shall not be construed as constituting manufacturer's authorisation of user's personnel, regardless of their levels of technical training, to open or repair the equipment.

Explicitly exempted herefrom are those maintenance and repair operations described in this manual.

### 6.1 possible causes / remedy

In any case of malfunction, you should check the wiring at first. Most errors are based on wrong wiring.



The last column shows the referring chapter.

symptom	possible cause	remedy
equipment doesn't work main switch doesn't shining	line cable not connect	connect line cable
	main switch off	turn main switch on
	both line fuses defective	check line fuses / exchange
	wrong line voltage adjusted	adjust right line voltage with fuse drawer
equipment doesn't work main switch shining	lamp after changing wrong connect	check connector of the lamp
	lamp defective	change lamp
	one line fuse defective	check line fuses / exchange
	internal fuse defective	check internal fuse / exchange
	ventilator blocked / defective	check ventilator / exchange
	wrong line voltage adjusted	adjust right line voltage with fuse drawer
intensity regulation doesn't work	no signal on the video-in connector (only Xenon XL-A100)	check video-in and connection
	intensity regulation control board defective	change intensity regulation control board
	wrong light cable in adapter	change light cable or adapter
lamp sends only a flash light but doesn't work	ventilator blocked / defective	check ventilator / exchange
	lamp life worn-out / exceed	change lamp
	power supply defective	change power supply
clock doesn't work cor- rect (only Xenon XL- A100)	clock control board defective	change

### 6.2 selection of the line voltage setting

To set the correct voltage proceed as follows:

- **PULL OUT THE MAINS PLUG!**
- Using a small screwdriver or other sharp instruments, the black rectangular board above the socket can be lifted out.
- The white panel with the fuse can be taken out and turned 180°, and then put back into the fuse container.
- After that the rectangular fuse board can be put back (the small nose of the board facing downwards) and firmly pressed until it has completely snapped in.
- Now the small white panel should show the correct voltage.
- 



### 6.3 exchanging the mains fuses

mains fuses are located on the rearpanel of the control unit, right above the mains terminal device in a small drawer. If you need to exchange the mains fuses, proceed as follows:

- **PULL OUT THE MAINS PLUG!**
- Loosen the drawer by unfastening the two clamps located to the left and to the right of the drawer with a peaked tool and pull out the drawer.
- Take out the fuses.
- Check the fuses. A blown fuse is indicated by the blackened glass cylinder or the visibly melted fuse conductor. If necessary, check the fuse with an ohmmeter.
- Install the corresponding fuses.
- Re-install the fuse-drawer.
- Switch on the equipment again. If you have exchanged a defective fuse against a new one and the fuse blows again, the unit has an error. In this case, you must return the device to your dealer for testing and repair.

### 6.4 replacing the lamp

The only part subject to wastage in the equipment are the lamps. The manufacturer of the Xenon lamp estimates the minimum life expectancy as 500 hours. After that, the quoted light wattage reduces drastically and there may be difficulties in igniting. In order to secure safe operation of the equipment, the lamp should be changed after expire of this operation time. The life time indicator (only Xenon XL-A100) built into the appliance shows the remaining operating time for the lamp. When the operating time has expired, the lamp must be changed for a new one.



Since the lamp used is a high pressure Xenon-lamp, whose small combustion chamber is high pressure, so the bulb can explode if you handle it incorrectly (danger of glass splinters)! The lamp may only be changed by qualified personnel, and following the prescribed safety precautions. Send, therefore, for the qualified person, when it is necessary to replace the lamp.

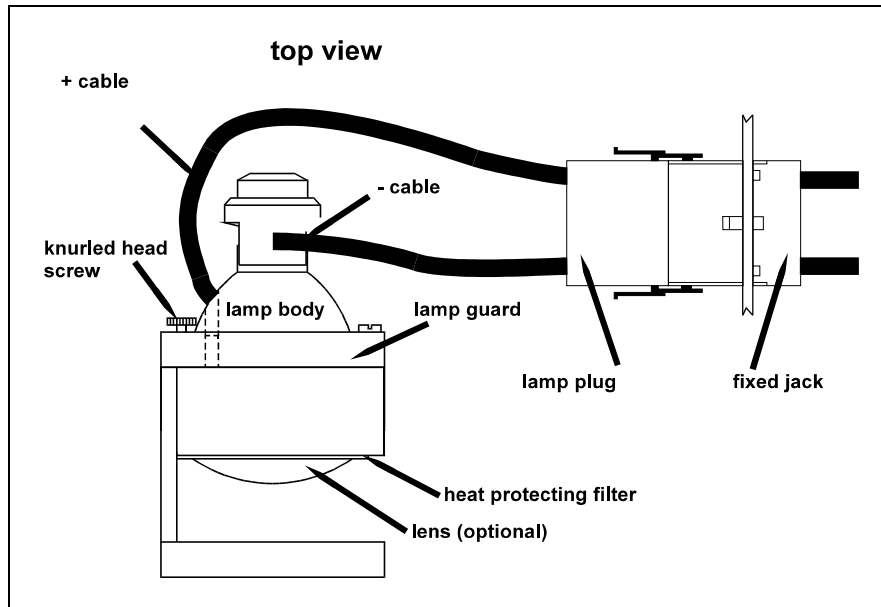
#### **PULL OUT MAINS PLUG!**

When handling the lamp, proceed with great care. It is absolutely necessary to observe the following precautions:

- When handling the lamp, protective goggles and gloves, which also protect the arteries, must be worn!
- The lamp must be stored in the original packing, when outside the equipment, never left lying around!
- Never interfere with the contacts, the electrodes or the electrode connections, or exert pressure or stronger action on other parts of the lamp!
- Send back old burnt out lamps in the original packing to the supplier for disposal!
- Never throw used lamps into the rubbish: Dangerous for playing children or other innocent parties, who may not be aware of the danger!

If you observe the safety precautions, there is absolutely no danger and you can proceed to easily change the lamp in the following manner:

- Loosen the 5 screws. Take off the cover and place it beside the unit.
- Attention: If the machine has been operating shortly beforehand the lamp could be very hot.
- All remaining current in the electronics will be, in a few seconds after switching off the equipment, completely safely discharged, so there is no danger in handling the equipment here.
- Disconnect the Xenon lamp connector plug.
- Loosen the knurled head screw and push up the lamp guard.
- Pull up the Xenon lamp out of its support.
- Push the new Xenon lamp into the same position in the support.
- Push down the lamp guard and tighten the knurled head screw.
- The Xenon lamp is thus automatically correctly adjusted.
- Re-connect the plug that is attached to the new Xenon lamp. You cannot mix up the connectors due to its non-symmetric design.
- Reset the operating time indicator (only Xenon XL-A100) to 500 hours. This is done by simply pushing the small slide-switch on the operating time indicator panel into opposite position.
- Re-install the cover and tighten it with the 5 screws. Observe the grounding cable!



**Further servicing, which should be done in conjunction with lamp replacement**

After 500 hours operation, dust may have been sucked through the ventilator blades into the equipment, depending on the conditions in the environment. This dust should be removed from the equipment with a vacuum cleaner using a small nozzle attachment. Dust can sometimes cling quite firmly to the ventilator blades. This should then be cleaned with a cloth and a little alcohol/spirits. Likewise dust settles on the heat protective filter (with lens, optional), this should also be cleaned with a soft cloth or blotting paper and pure alcohol or spirits.

## 6.5 cleaning / disinfecting

**NOTE: PULL OUT THE MAINS PLUG!**

All parts of the outer surfaces of the equipment are totally insensitive to all the usual cleaning and disinfecting materials, so that you can use any of these without limitation. Apply liquids using a soft cloth or soft blotting paper, in order to avoid scratches on the surfaces and in order to be able to control the amount of liquid.

With flammable liquids like alcohol especially, you should apply with a cloth. Do not let any liquid get into the equipment. After cleaning with flammable liquids, leave the equipment to dry for one hour, before it is switched on again. There is danger for example that an alcohol-air explosive mixture could form after cleansing.



## 7 technical data

### mains connections

115/230VAC  $\pm 10\%$ , 50/60Hz, 1,6/0,8A

### main fuses

fuses 5x20 mm, 2 fuses, T 2,5/1,25A

### video brightness control (only Xenon XL-A100)

adjusts automatically the monitor brightness from the video signal.

### light guide connection

through an adapter, all lamp guides can be fitted to the equipment

### lamp operating hours indicator (only Xenon XL-A100)

The remaining lamp life is indicated by LED in stages of 500, 250, 100, 50 hours. When the time is expired this will be indicated by a flashing red LED.

### mode of operation

- manual: The picture brightness can be made brighter or darker by using two push buttons.
- automatic (only Xenon XL-A100) Guided by the video signal, the monitor screen brightness is controlled automatically.

### lamp

Xenon-high pressure lamp, which is built into a reflector, so that when you change the lamp, no resetting is necessary. The life expectancy amounts to 500 hours, the light spectrum is daylight of about 5600 °K, the power input is nominally 100 watt.

### protective class

BF (CF)

### dimensions

W = 355 mm, H = 110 mm, D = 325 mm

### weight

8,5 kg

## 8 spare parts

### lamp

type XBO R 100 W/45C

### fuses

fine fuses, 5x20 mm

- line voltage 230VAC = 2 pcs. fuse T 1,25A.
- line voltage 115VAC = 2 pcs. fuse T 2,5A.

### frontpanel controller

### power supply

### starter

### clock card (only Xenon XL-A100)

## 9 table 'technical service-information'

[illegible]